경영학석사학위논문

CEO Inside Debt and Financing Choice

최고경영자의 이연보상 및 연금이 기업의 자금조달선택에 미치는 영향

2017 년 8 월

서울대학교 대학원

경영학과 회계학전공

류 영 지

Abstract

CEO Inside Debt and Financing Choice

Ryoo, Youngji
College of Business Administration
The Graduate School
Seoul National University

This paper examines the effects of CEO inside debt on firms' financing behavior in the funding process. Consistent with prior literature suggesting the beneficial effect of CEO inside debt on the firm's debt contracting environment, I find that firms with large CEO inside debt use more debt issuance and less cash holdings in funding the financing deficit caused by investments and payouts in excess of operating cash flows. I show the observed effects of CEO inside debt are more pronounced for financially constrained firms that have difficulty in accessing external capital markets. Overall, my evidence highlights the importance of incorporating the financing implications of inside debt in the optimal design of executive compensation contracts.

Keywords: executive compensation, inside debt, agency costs of debt, external financing

Student Number: 2015 – 20605

Table of Contents

I. Introduction……..……..……..……...1

II. Related Literature and Hypothesis ..……5

III. Research Design and Sample 10

3.1 Key Variables…….....…….…..…… ……10

3.2 Research Design..…….....…….……...……..……12

3.3 Sample Selection..…….....…….……..……. 15

IV. Empirical Results.....…….....……...16

4.1 Univariate Results……...…….…….....……..... 16

4.2 Main Results…...…….……..……. 17

4.3 Additional Results.……..…… 18

4.4 Cross-Sectional Variations: Financial Constraint……. .. ……...21

4.5 Chief Financial Officer (CFO) Inside Debt…….…….……... 22

4.6 Characteristics of CEO and Compensation Structure…….……... 23

V. Conclusion ..……..24

List of Tables

Table 1. Descriptive Statistics ……29

Table 2. Pearson Correlations ..……30

Table 3. Inside Debt and Financing Choice: Main Regressions ……..31

Table 4. Inside Debt and Financing Choice: Additional Results ...…….32

Table 5. Inside Debt and Financing Choice: Cross-Sectional Variations on Financial Constraint ..……....35

Table 6. Inside Debt and Financing Choice: CEO vs. CFO…….....37

Table 7. Inside Debt and Financing Choice: CEO and Compensation Characteristics ..……...……..…….…..38

Appendix 1. Variable Definitions ..…….…….……...……28

1. Introduction

The effects of managerial incentives arising from compensation structure on corporate policies are significant and have been extensively investigated in prior literature (Jensen and Meckling 1976; Amihud and Lev 1981; Agrawal and Mandelker 1987; Guay 1999; Fenn and Liang 2001; Rajgopal and Shevlin 2002; Coles et al. 2006; Low 2009). Following the U.S. Securities and Exchange Commission's (SEC) new disclosure requirements on executives' pension holdings and deferred compensation in 2006, a literature examining the effects of the Chief Executive Officer's (CEO) "inside debt" on corporate policies has emerged (e.g. Sundaram and Yermack 2007; Wei and Yermack 2011). While extant literature suggests that CEO inside debt lowers the agency costs of debt by resolving conflicts of interest between creditors and equity investors (Jensen and Meckling 1976; Edmans and Liu 2011), there is mixed evidence on how CEO inside debt influences a firm's financing behavior. In particular, existing evidence on the relation between CEO inside debt and financial policies offers mixed implications by investigating different financing decisions in isolation (e.g., liquidity, maturity structure, leverage) or providing conflicting results. For this reason, this paper studies the effects of CEO inside debt on corporate financing choice with respect to funding of the financing deficit and provides new evidence on the beneficial role of inside debt in the firm's debt contracting.

Extant literature documents that CEOs with large pensions and deferred compensation manage their firms conservatively by investing in less risky projects and adopting more conservative corporate policies (Cassell et al. 2012; Phan 2014; Liu et al. 2014; Srivastav et al. 2014; Caliskan and Doukas 2015; Eisdorfer et al. 2015; Van Bekkum 2016). In line with the theoretical predictions of Jensen and Meckling (1976) and Edmans and Liu (2011), firms with CEOs having large inside debt are associated with lower probability of default (Sundaram and Yermack 2007) and debt investors respond positively to the disclosure of

large inside debt holdings (Wei and Yermack 2011). Recent research provides additional evidence on the benefits of CEO inside debt on the firm's debt contracting efficiency. Larger CEO inside debt helps financially constrained firms to make investments (Lee et al. 2016), leads to lower bond spreads and fewer covenants (Anantharaman et al. 2014), facilitates short-term debt financing (Dang and Phan 2016), and is associated with higher financial leverage (Brisker and Wang 2017). However, there are gaps in the literature on whether CEOs with large inside debt prefer conservative leverage policy due to risk aversion (Cassel et al. 2012) or use more aggressive debt financing on the back of favorable debt contracting environment (Anantharaman et al. 2014; Brisker and Wang 2017). In addition, the literature is less clear on the implications of CEO inside debt for the firm's overall financing behavior. If the debt capital market regards the interest alignment between the CEO and creditors through inside debt holdings favorably and affords the firm lower costs of debt financing, it is expected that firms with CEOs having large inside debt use relative more debt financing and less equity financing or cash holdings in funding the financing deficit than firms with CEOs having little inside debt.

I operationalize the CEO's inside debt incentives using the ratio of inside debt holdings to the sum of inside equity and inside debt holdings.[1] Following the literature on capital structure (e.g., Shyam-Sunder and Myers 1999; Frank and Goyal 2003), I use cash flow statement data to estimate the firm's financing deficit, which is defined as the sum of cash dividends and investments net of internally generated cash flows. By definition, the firm needs to fund its financing deficit either by using its cash holdings or by raising capital from external capital markets. In order to address the interdependence of corporate financing channels (e.g., Gatchev et al. 2009, 2010; Dasgupta et al. 2011; Chang et al. 2014), I estimate

[1] Inside debt is defined as the sum of present values of the executive's deferred compensation and accumulated pension benefits.

a set of equations in which different sources of financing—cash holdings, net debt issuance and net equity issuance—are regressed on the financing deficit and control variables identified in prior literature as affecting the firm's capital structure decision. In each regression, my interest is on the interaction term between the financing deficit and my proxy for CEO inside debt. By relying on the accounting identity in the statement of cash flows, research design of the paper facilitates interpretation of the effects of CEO inside debt on how each dollar of the financing deficit is funded through various sources of financing.

Using a sample of 7,397 firm-year observations with required compensation and financial data from ExecuComp and Compustat for the period 2007-2014, I find empirical support for my main prediction that CEO inside debt is positively (negatively) related to the use of net debt issuance (cash holdings) in funding the financing deficit. I document insignificant results for net equity issuance. Specifically, my results show that firms with significant CEO inside debt fund one dollar of the financing deficit with \$0.28 from cash holdings, \$0.56 from net debt issuance and \$0.16 from net equity issuance, while firms with no CEO inside debt finance the deficit with \$0.40 from cash holdings, \$0.44 from net debt issuance and \$0.16 from net equity issuance. In additional tests, I observe that my main results are robust to 1) using subgroup indicator variables based on the significance of CEO inside debt, 2) decomposing inside debt into pensions and deferred compensation components and 3) decomposing net debt issuance into short-term and long-term debt. Next, the results indicate that the effect of CEO inside debt on the greater (lesser) use of net debt issuance (cash holdings) in funding of the financing deficit is more pronounced for financially constrained firms than for financially unconstrained firms. I also find a strong influence of the chief financial officer's (CFO) inside debt holdings on corporate financing choice and document robust results controlling for various CEO-level characteristics.

I contribute to the literature on the relation between managerial compensation and firm

policy. In this paper, I focus on the effects of CEO inside debt—debt-like compensation held by the CEO in the form of accumulated pension benefits and deferred compensation—on the firm's financing behavior with respect to cash flow shortfalls. Although an increasing number of both theoretical and empirical studies suggest that CEO inside debt is associated with conservative financial policies (Cassell et al. 2012; Liu et al. 2014) and lower costs of debt capital (Wei and Yermack 2011; Anantharaman et al. 2014; Dang and Phan 2016), extant literature offers mixed evidence on the financing decision of the firm in response to cash flow shortfalls. My study attempts to fill this gap by examining the effect of CEO inside debt on the way the financing deficit is funded by different sources of financing based on the cash flow identity in financial statements. By considering the interdependence of various financing channels, I provide novel evidence on the role of CEO inside debt in shaping the firm's financing behavior beyond that documented by prior studies that suggest conflicting interpretations (Cassell etal. 2012; Brisker and Wang 2017). I suppose that the board of directors and its compensation committee may take into account the effects of inside debt on the firm's access to capital markets and financing choice in designing executive compensation contracts.

Lastly, I add to the broad literature in corporate finance investigating the firm's financing decisions. Shyam-Sunder and Myers (1999), Frank and Goyal (2003) and Bharath et al. (2009) test the pecking order theory of financing, while Fama and French (2005) study firms' equity financing decisions over time. Evidence in Gatchev et al. (2009) and Gatchev et al. (2010) highlights that firms' investment and financing decisions are jointly determined. In previous research, information asymmetry between managers and investors plays a key role in determining firms' capital structure decisions and financing behavior (Myers 1984; Myers and Majluf 1984). My evidence complements this line of research by suggesting that managerial incentives arising from inside debt compensation may affect the relative use of

different financing channels in the funding process.[2]

The paper proceeds as follows. Section 2 explores the related literature and develops main hypotheses. Section 3 introduces the paper's empirical design, key variables and sample. Section 4 reports results of empirical analyses and Section 5 concludes the paper.

2. Related Literature and Hypothesis

Following the seminal article by Jensen and Meckling (1976) on agency costs and firm behavior, a lion's share of the literature on executive compensation has focused on examining the implications of cash and equity-based compensation such as bonus, stocks and stock options for the firm's investment and financing behaviors (Amihud and Lev 1981; Agrawal and Mandelker 1987; Fenn and Liang 2001). In this line of research, equity-based compensation better aligns managers' incentives with those of shareholders and motivates the managers to take greater firm risk for the benefit of shareholders whose payoff function resembles that of stock option (Jensen and Meckling 1976; Guay 1999; Rajgopal and Shevlin 2002; Coles et al. 2006; Low 2009).

While shareholders' agency costs can partly be mitigated with equity pay from the perspective of optimal contracting (Hemmer et al. 1999; Hirshleifer and Suh 1992), it breeds a host of other issues for the stakeholders of the firm including the shareholders themselves. Greater equity-based pay may actually damage the shareholder value by motivating the manager to engage in myopic corporate policies in hopes of boosting short-term stock price. Excessive equity incentives in CEO compensation package also induce the manager to manipulate accounting earnings and commit financial reporting fraud in an effort to sell their holdings at inflated price (Cheng and Warfield 2005; Bergstresser and Philippon 2006; Burns

[2] Leary and Roberts (2010) find incentive conflicts being more dominant than information asymmetry in explaining the pecking order theory.

and Kedia 2008). Also, as noted by Jensen and Meckling (1976), excessive equity compensation may exacerbate the risk-shifting problem in which creditors as fixed claimants on the value of the firm bear higher costs of bankruptcy from increased risk-taking by the agent. Therefore, stock-based compensation of corporate executives is in many respects not a *panacea* for the agency problem.

Other forms of executive compensation arise as part of the optimal contracting process (Frydman and Jenter 2010). Some of the significant components of executive compensation that have received relatively less attention in the literature include debt-like, longer-term forms of executive pay such as pension benefits and deferred compensation. Because of the unsecured and unfunded nature of these forms of pay, the manager stands *pari passu* with other unsecured creditors of the firm in the case of a bankruptcy. Collectively referred to as "inside debt" in the literature, pension benefits and deferred compensation have received limited attention due to the absence of disclosure requirements until late 2006.

The literature has recognized the potentially significant role of inside debt in the optimal contracting process. As a solution to the risk-shifting problem, Jensen and Meckling (1976) suggest that the manager hold both inside debt and equity proportionately to the debt-to-equity ratio of the firm. Using unique data for a small number of CEOs of firms in the S&P 500, Bebchuk and Jackson (2005) provide evidence that defined-benefit pensions represent a substantial part of total executive compensation. However, any large-sample evidence on the significance and role of inside debt in agency contracts was not available until 2006 when the SEC expanded disclosure requirements on executive compensation to include detailed information on pension benefits and other deferred compensation for firms with fiscal years ending in December 2006 or later.

Following the disclosure reform by the SEC, a literature examining the implications of inside debt on managerial behavior and corporate policy has emerged. On the theoretical side,

Edmans and Liu (2011) extend the simple, one-size-fits-all model of Jensen and Meckling (1976) in relation to inside debt as a solution for the agency costs of debt and show that managers' inside debt holdings are associated with conservative policies and increase (decrease) in debt (equity) value.[3] One of the first empirical endeavors in this line of research is Sundaram and Yermack (2007) who examine some of the Fortune 500 companies and document that the ratio of CEO inside debt to inside equity is negatively related to estimated default risk using Merton's (1974) distance-to-default model. Wei and Yermack (2011) study investors' reactions to firms' initial disclosure of inside debt holdings in 2007 and find positive (negative) price reaction to large inside debt holdings by the CEO in the debt (equity) capital market.

Subsequent studies find some of the ways in which inside debt holdings influence managerial behavior with respect to the firm's investment and financing decisions. Cassell et al. (2012) find negative relations between CEO inside debt and stock return volatility, risky investments and book leverage, and positive relations between CEO inside debt and firm diversification and balance sheet liquidity. Other studies complement this line of inquiry by documenting that inside debt is associated with conservative corporate behavior in mergers and acquisitions (Phan 2014), payout policy (Srivastav et al. 2014; Eisdorfer et al. 2015), bank risk management (Van Bekkum 2016) and cash holdings (Liu et al. 2014). In addition, accounting research shows that CEOs with large inside debt adopt conservative accounting policies that result in less earnings management (Dhole et al. 2015), less tax sheltering (Chi et al. 2017), higher accounting quality, and lower likelihood of future stock price crash (He 2015).

Consistent with CEO inside debt holdings reducing the agency costs of debt, several

[3] Campbell et al. (2016) examine the theoretical prediction of Edmans and Liu (2011) in search of a model that explains cross-sectional differences in firms' optimal inside debt policies and conclude that optimal inside debt to equity ratios depend on firm characteristics. Consistent with theoretical prediction, they find that the value of debt is increasing in upward adjustments to the relative leverage ratio.

studies directly examine the effects of inside debt on firms' debt contracting efficiency. Based on a small sample of loans, Anantharaman et al. (2014) show that CEO inside debt leads to lower bond yields and fewer financial covenants.[4] Dang and Phan (2016) find that CEO inside debt facilitates the firm's access to debt markets and motivates the manager to take on greater short-term debt relative to long-term debt. Recent evidence by Brisker and Wang (2017) suggests that firms with large CEO inside debt have higher financial leverage. On a related note, Lee et al. (2016) find that the beneficial effects of inside debt on corporate financing translate into increased investments for firms in financial distress. However, extant literature offers little evidence on the implications of CEO inside debt for overall financing choice using a large sample. In addition, the finding of Cassell et al. (2012) that CEO inside debt is negatively related to book leverage runs counter to the expectation that firms may increase the use of debt financing on the back of lower cost of debt afforded by CEO inside debt.[5]

In summary, both theoretical and empirical findings suggest that CEO inside debt is associated with lower agency costs of debt and cost of debt capital. However, the evidence in extant literature offers limited inference on the effect of inside debt on the relative use of different financing channels in the funding process of firms. To fill this void in the literature, I examine the association between CEO inside debt holdings and firms' financing channels. In particular, I hypothesize that if CEO inside debt is related to lower cost of debt financing, firms with CEOs having large inside debt holdings as a fraction of their total firm-related wealth use a greater amount of debt financing in funding the financing deficit.[6] Accordingly,

[4] Both Bebchuk and Jackson (2005) and Anantharaman et al. (2014) question the nature and effectiveness of executive inside debt as an unsecured claim on the value of firm by the CEO that renders him/her on a similar ground as other unsecured external creditors. Using a proprietary sample, Gerakos (2010) argues that most of executive pensions are indeed unsecured in the event of a bankruptcy.

[5] Cassell et al. (2012) caution interpretation of their results given their use of the ratio of CEO leverage to firm leverage as the main explanatory variable.

[6] As will be detailed in Section 3, financing deficits and investment deficits will be used interchangeably with

I expect the firms with CEOs having large inside debt to lower the level of equity financing in the funding process. My expectation on equity financing is based on the pecking order theory which predicts that equity financing suffers the most from information asymmetry and is thus used as a last resort (Myers 1984; Myers and Majluf 1984). In addition, I predict that inside debt is negatively related to the use of cash reserves in financing of the deficit, which is consistent Liu et al.'s (2014) finding that CEOs with large inside debt choose to maintain higher cash holdings. In essence, my main hypothesis can be summarized in an alternative form as below:

H1: *CEO inside debt is positively (negatively) related to the use of debt financing (equity financing and cash holdings) in funding the financing deficit*

Under the wedge definition of Fazzari et al. (1988), financial constraint is the difference between the firm's opportunity cost of internal capital and its cost of external capital. In other words, financial constraint measures the extent to which the firm experiences difficulty in raising external capital. To the extent financial constraint is associated with limited access to external capital markets and CEO inside debt enhances the firm's access to debt financing, the effect of CEO inside debt on increased use of debt financing in the funding process may be greater for financially constrained firms. As for the uses of cash holdings and equity financing in the funding process, I expect the effect of CEO inside debt on lower use of either cash holdings or equity financing to be more pronounced for financially constrained firms. In sum, I expect a more pronounced effect of CEO inside debt on the firm's financing behavior for financially constrained firms than for financially unconstrained firms. The second, cross-sectional prediction can be stated in an alternative form of hypothesis as below:

---

both representing the sum of cash outflows for investments and dividends in excess of operating cash flows, which is consistent with the original definition of Shyam-Sunder and Myers (1999).

H2: *The effect of CEO inside debt on the firm's financing behavior predicted in H1 is more pronounced for financially constrained firms than for financially unconstrained firms*

3. Research Design and Sample

3.1 Key Variables

Following prior literature on CEO inside debt (e.g., Wei and Yermack 2011; Cassell et al. 2012; Liu et al. 2014; He 2014; Lee et al. 2016), I operationalize my main proxy for the CEO's inside debt incentives using the ratio of CEO inside debt to his/her total firm wealth as follows:

$$\begin{aligned} CEOID &= CEO\ Inside\ Debt\ /\ CEO\ Total\ Firm\ Wealth \\ &= CEO\ Inside\ Debt\ /\ (CEO\ Inside\ Debt + CEO\ Inside\ Equity) \end{aligned}$$

For each firm-year, inside debt is measured as the sum of the CEO's pension benefits and total deferred compensation. The CEO's pension benefits are the aggregate actuarial present value of pension benefits under his pension plans at the end of fiscal year. Deferred compensation is the aggregate balance in non-tax-qualified deferred compensation plans at the end of fiscal year. The executive's total firm wealth is measured as the sum of his inside debt holdings and equity holdings. The CEO's equity portfolio is the sum of the value of common stock shares owned by the CEO and the value of all tranches of his option holdings outstanding at the end of fiscal year.[7] Although the value of *CEOID* ranges from 0 to 1, I find that in more than half of the observations, CEOs have less than 5% of their total firm wealth in inside debt. Given the highly positively skewed distribution of *CEOID*, I divide the sample into four groups based on the level of *CEOID* to create an indicator variable, assigning 0 to firms with no inside debt, 0.33 to firms having the value of *CEOID* between

[7] The value of option portfolios is estimated using the Black-Scholes (1973) formula following the methodology of Core and Guay (2002) as used in Daniel et al. (2013).

zero and sample median, 0.66 to firms having the value of *CEOID* between sample median and the 75th percentile, and 1 to firms having the value of *CEOID* between the 75th percentile or above. My main results remain qualitatively the same using the log value of *CEOID* (Chi et al. 2017). Lastly, in order to partially address the endogeneity concern, I measure my proxy for CEO inside debt at the end of fiscal year t-1.

Jensen and Meckling (1976) argue that when the CEO's personal leverage (*CEOID)* is greater than firm leverage, he manages the firm more conservatively and becomes better aligned with creditors of his firm. The underlying assumption of their conjecture is that the CEO relative leverage, which is the ratio of the CEO's personal leverage to firm leverage, from the perspective of shareholders is optimal at 1. Accordingly, recent literature has used alternative proxies for CEO inside debt including the CEO relative leverage and CEO relative incentive, both of which are essentially the ratio of CEO leverage to firm leverage.[8] However, in the model developed by Edmans and Liu (2011), the CEO's optimal leverage may be above or below that of the firm depending on firm characteristics and the value of firm in different states of financial health. Campbell et al. (2016) provide empirical support that the CEO's optimal leverage may exhibit either an equity bias or a debt bias depending on firm attributes. Therefore, an arbitrary interpretation of the CEO relative leverage greater than 1 as exhibiting a debt bias can be misleading. In addition, using the "ratio-of-ratios" approach makes the implicit assumption that debt claims against the firm are mostly unsecured (Lee et al. 2016). Given my inquiry on the relative use of different financing channels in the funding process of firms, including firm leverage in the denominator of the CEO relative leverage may mechanically relate the firm's capital structure to external financing decisions (Cassell et al. 2012). For these reasons, my inferences are primarily based on CEO inside debt as defined

[8] See Wei and Yermack (2007) for details on the construction of CEO relative leverage ratios.

above.[9]

Following the literature on capital structure and financing decisions (e.g., Shyam-Sunder and Myers 1999; Frank and Goyal 2003; Bharath et al. 2009), I define the financing deficit, DEF_{it}, as the sum of investments and cash dividends net of internally generated cash flows:

$$DEF_{it} = DIV_{it} + INV_{it} - CF_{it} \quad (1)$$

where DIV_{it} are cash dividend payments, INV_{it} are investments net of cash receipts from the sales of fixed assets, and CF_{it} are operating cash flows after interests and taxes net of changes in working capital.[10] The three financing channels are measured as changes in cash and cash equivalents (ΔC_{it}), net debt issuance (ΔD_{it}) and net equity issuance (ΔE_{it}) for firm i in year t. All variables are scaled by the beginning-of-period total assets and measured using data from the statement of cash flows (Frank and Goyal 2003; Bharath et al. 2009; Chang et al. 2014). Details on the key variables can be found in Appendix 1.

3.2 Research Design

In the finance literature, a large number of studies test theories of corporate financing. Notably, Shyam-Sunder and Myers (1999) and Frank and Goyal (2003) examine firms' debt financing decisions within the context of the pecking order theory of Myers (1984) and Myers and Majluf (1984), while Fama and French (2005) study factors driving firms' equity issuance decisions. However, these studies do not explicitly consider the interdependence of the firm's investment and financing decisions. In order to address the interconnectedness of financing and investment decisions and assess the relative importance of each financing channel, Gatchev et al. (2009) utilize the system of simultaneous equations in examining the

[9] My main conclusions, however, are robust to the use of relative leverage ratios.
[10] Following recent studies on cash-flow allocation (Bushman et al. 2011; Dasgupta et al. 2011; Chang et al. 2014), I define operating cash flows net of working capital accruals. See Bushman et al. (2011) for details.

firm's financing decisions as a function of its investments and operating cash flows.[11] Gatchev et al. (2010) and Dasgrupta et al. (2011) extend this empirical strategy to investigate the firm's financing- and investment-sensitivities to cash flows. Based on previous research, I construct a system of equations that regress financing channels on the financing deficit, DEF_{it}, and controls for factors affecting the firm's financing decisions.

In estimating their system of equations, Gatchev et al. (2009) and Gatchev et al. (2010) define variables in the cash flow identity using different sources in financial statements, force the cash flow identity to hold, and impose econometric restrictions on the coefficients in the system. According to Chang et al. (2014), however, using information from different financial statements and forcing restrictions on the coefficients may provide misleading inferences. Instead, the authors propose defining variables only using information from the statement of cash flows and estimating regressions equation-by-equation using ordinary least squares (OLS).[12] I build on their insights to construct my key variables using the statement of cash flows and estimate each equation separately using OLS. If the cash flow identity holds as it should in the absence of data error, the sources and uses of cash flows must match in the following manner as in Equation (2):

$$INV_{it} + DIV_{it} + \Delta C_{it} - \Delta D_{it} - \Delta E_{it} = CF_{it} \tag{2}$$

After rearranging above equation and noting my definition of the financing deficit, it follows that the financing deficit must be funded by either cash holdings, net debt issuance or net equity issuance, as shown below in Equation (3):

$$-\Delta C_{it} + \Delta D_{it} + \Delta E_{it} = DEF_{it} \tag{3}$$

[11] A number of studies attempt to tackle similar identification challenges using a system of simultaneous equations (Rogers 2002; Rajgopal and Shevlin 2002; Coles et al. 2006).
[12] Frank and Goyal (2003) also construct their variables using the statement of cash flow.

Based on this relation, I construct a set of Equations (4) – (6) in which each financing channel is regressed on the financing deficit, DEF_{it}, as below:[13]

$$\Delta C_{it} = \alpha^{\Delta C} + \beta^{\Delta C} DEF_{it} + Controls_{it-1} + Year\ FE + Industry\ FE + \varepsilon_{it} \quad (4)$$

$$\Delta D_{it} = \alpha^{\Delta D} + \beta^{\Delta D} DEF_{it} + Controls_{it-1} + Year\ FE + Industry\ FE + \varepsilon_{it} \quad (5)$$

$$\Delta E_{it} = \alpha^{\Delta E} + \beta^{\Delta E} DEF_{it} + Controls_{it-1} + Year\ FE + Industry\ FE + \varepsilon_{it} \quad (6)$$

My expectation in estimating Equations (4) – (6) is that the sum of the coefficients on DEF_{it} equals 1 in the following manner: $(-\beta^{\Delta C}) + \beta^{\Delta D} + \beta^{\Delta E} = 1.0$. That is, each dollar of the financing deficit, DEF_{it}, must be financed by either draining down existing cash reserves ($-\beta^{\Delta C}$) or raising external capital through net debt and equity issuances ($+\beta^{\Delta D}$ and $+\beta^{\Delta E}$). Following Frank and Goyal (2009) and Chang et al. (2014), *Controls* include firm-level factors that have been identified in prior literature as influencing the firm's capital structure decision: market-to-book ratio (MB_{it-1}) and sales growth (SG_{it-1}) as proxies for investment opportunities, log of the book value of assets ($SIZE_{it-1}$) as a proxy for firm size, book leverage ratio (LEV_{it-1}) as a proxy for *ex-ante* capital structure, and the tangibility ratio ($TANGIBLE_{it-1}$) as a proxy for asset tangibility. All of the control variables are measured at the end of year *t-1*.

To examine the effect of CEO inside debt on relative uses of different financing channels, I interact DEF_{it} with $CEOID_{it-1}$, following the approach in Bharath et al. (2009) who examine the impact of information asymmetry on firms' capital structure decisions by interacting various measures of information asymmetry with DEF_{it}. Accordingly, I estimate Equations (7) – (9) separately using OLS as below:

$$\Delta C_{it} = \alpha^{\Delta C} + \beta^{\Delta C} DEF_{it} + \lambda^{\Delta C} DEF_{it} * CEOID_{it-1} + Controls_{it-1} + Year\ FE + Industry\ FE + \varepsilon_{it} \quad (7)$$

[13] As noted in Chang et al. (2014), the Seemingly Unrelated Regression (SUR) estimates are expected to the same as the equation-by-equation OLS estimates if the same set of explanatory variables is used in each regression (Greene 2012).

$$\Delta D_{it} = \alpha^{\Delta D} + \beta^{\Delta D} DEF_{it} + \lambda^{\Delta D} DEF_{it}*CEOID_{it-1} + Controls_{it-1} + Year\ FE + Industry\ FE + \varepsilon_{it} \quad (8)$$

$$\Delta E_{it} = \alpha^{\Delta E} + \beta^{\Delta E} DEF_{it} + \lambda^{\Delta E} DEF_{it}*CEOID_{it-1} + Controls_{it-1} + Year\ FE + Industry\ FE + \varepsilon_{it} \quad (9)$$

In line with prior evidence in the literature that firms with CEOs having large inside debt have lower costs of debt financing, I expect the coefficient on the interaction term, $\lambda^{\Delta D}$, in Equation (8) to be positive, suggesting that such firms use relatively more debt financing in the funding process than control firms. On the other hand, I expect a positive and a negative coefficient on $\lambda^{\Delta C}$ and $\lambda^{\Delta E}$ in Equations (7) and (9), respectively. That is, firms with large CEO inside debt use less cash holdings and equity financing in the funding process than control firms.[14]

3.3 Sample Selection

Data in this study comes mainly from Compustat Industrial files and ExecuComp. Following the standard in the literature, I exclude financial institutions (SIC 6000-6999) and utilities (SIC 4900-4999) from my sample. Given the availability of data on executive inside debt for firms with fiscal years ending in December 2006 or later and my use of lagged value of *CEOID*, the sample period is limited to 2007-2014. Following Chang et al. (2014), I require non-missing/non-negative information on total assets and common stock equity, and exclude observations with annual asset growth or sales growth in excess of 100%. Also, firm-years with less than $1 million of total sales are discarded. These screens collectively serve to exclude firms with volatile financial statement data and firms that have undergone significant

[14] By design, the following equality must hold: $(-[\beta^{\Delta C} + \lambda^{\Delta C}]) + (\beta^{\Delta D} + \lambda^{\Delta D}) + (\beta^{\Delta E} + \lambda^{\Delta E}) = 1.0$. As described in Section 3.3 on sample selection, any discrepancy between the sum of the coefficients and unity is less than 1% of the beginning-of-period total assets.

restructuring events.[15] Also following Chang et al. (2014), I exclude observations for which the absolute value of the difference between cash inflows and outflows exceeds more than 1% of the beginning-of-period total assets. Lastly, I winsorize all continuous variables at the 1% and 99% of their respective distributions to minimize the effect of extreme observations. The final sample consists of 7,397 firm-years for the period of 2007-2014. The variables used in this paper are defined in more detail in Appendix 1.

As additional controls to ensure that my results are not affected by time-series variations across years and cross-sectional differences across industries, I include year and industry fixed effects in all of my specifications. In assessing the statistical significance of coefficient estimates, I adjust standard errors of firm-level clustering to mitigate within-firm correlations (Petersen 2009).

4. Empirical Results

4.1 Univariate Results

Descriptive statistics of the sample are provided in Table 1. For the sample period of 2007 – 2014, the number of observations in my sample is 7,397 firm-years, which is in line with that of prior studies on CEO inside debt. Mean (median) ratio of the CEO's inside debt holdings to his/her total firm-related wealth, $CEOID_{it-1}$, is 12.8% (3.3%). Compared to the CEO, an average CFO also has a similar level of inside debt holdings with mean (median) ratio of the CFO's inside debt to his/her total firm wealth at 13.4% (3.3%). On average, the sample firms pay out 1.2% of the beginning-of-period total assets as dividends (DIV_{it}) and invest about 7.7% (INV_{it}). The firms fund these uses of cash flows with operating cash flows

[15] Also in line with Chang et al. (2014), observations for which the absolute value of the difference between cash inflows and cash outflows is greater than 1% of the beginning-of-period total assets are excluded. Chang et al. (2014) suggest possible causes for the violation of the accounting cash flow identity: 1) inconsistent definitions of variables from different sources, 2) rounding error, 3) misrecording of data, and 4) winsorization. The use of data from the statement of cash flows and the 1% trim rule broadly mitigate these concerns.

net of working capital investments (CF_{it}), which accounts for about 10.8% of the beginning-of-period total assets. Therefore, the sample firms, on average, have financing surpluses (DEF_{it}) that amount to 1.7%. For those firms requiring additional funding, the gap between the uses of cash flows and operating cash flows is bridged by the use of existing cash holdings (ΔC_{it}), net debt issuance (ΔD_{it}) and net equity issuance (ΔE_{it}). I find that about 35% of my sample firms have the financing deficit ($DEF_{it} > 0$), while 65% of the firms have financing surplus ($DEF_{it} < 0$). The sample distributions by both year and Fama-French industry exhibit stable patterns.

Pearson correlations in Table 2 show that firms with large CEO inside debt have lower sales growth, pay higher dividends, are larger in terms of total assets and have higher asset tangibility. These preliminary results are consistent with prior studies that firms with large CEO inside debt tend to be larger and more mature firms. CEO inside debt is positively correlated with book leverage (LEV_{it-1}), which contrasts with the finding in Cassell et al. (2012) that CEO inside debt is negatively correlated with current and future book leverage as CEOs with large inside debt prefer lower financial risk. I attribute the contrast to Cassell et al.'s (2012) use of the CEO relative leverage, which has the firm's book leverage in the denominator and thus may mechanically be related to the dependent variable, as their main test variable.

4.2 Main Results

Regression results of testing Hypothesis 1 are reported in Table 3. In Columns (1) – (3), I estimate the set of Equations (4) – (6) without including the interaction between DEF_{it} and $CEOID_{it-1}$ in each regression. After controlling for the factors related to financing decision, I find that in order to fund each dollar of the financing deficit, the average firm uses \$0.35 from its cash holdings, and raises about \$0.49 and \$0.16 from net debt and net issuances,

respectively. In Columns (4) – (6), I find significantly positive coefficients on both $\lambda^{\Delta C}$ (0.12 with t-statistic = 4.2) and $\lambda^{\Delta D}$ (0.12 with t-statistic = 4.0), suggesting that firms with large CEO inside debt use less cash holdings and more debt issuance in the funding process. On other hand, the coefficient on the interaction term in the equity financing regression, $\lambda^{\Delta C}$, is insignificant (-0.01 with t-statistic = -0.5), implying that CEO inside debt has a statistically insignificant effect on the relative use of net equity issuance in the deficit funding. In economic terms, the results show that firms with large CEO inside debt fund one dollar of the financing deficit with \$0.28 from cash holdings, \$0.56 from net debt financing and \$0.16 from net equity financing, while firms with no CEO inside debt fund one dollar of the financing deficit with \$0.40 from cash holdings, \$0.44 from net debt financing and \$0.16 from net equity financing.

Overall, my baseline results in Table 3 provide empirical support for Hypothesis 1 that firms with large CEO inside debt fund the financing deficit more with debt financing and less with cash holdings. The evidence is consistent with current literature on CEO inside debt, which suggests that firms with large CEO inside debt have lower cost of debt financing due to improved debt contracting environment (Wei and Yermack 2011; Anantharaman et al. 2014; Dang and Phan 2016; Brisker and Wang 2017), but contrasts with studies finding conservative financial policy in relation to CEO inside debt (Cassell et al. 2012). The evidence on the use of cash holdings is in line with Liu et al. (2014) who suggest that the CEO with large inside debt holdings maintains a higher level of cash holdings to prevent financial distress.

4.3 Additional Results

In Panel A of Table 4, I repeat my main analysis using subgroup indicators based on the level of *CEOID*. Consistent with previous results, I find in Columns (1) – (3) that firms

whose CEOs have substantial amount of their wealth tied to their firms in the form of inside debt show a greater use of net debt issuance and a lower use of cash holdings and net equity issuance in funding the cash flow deficit.

In Panel B of Table 4, I consider the implications of individual components of CEO inside debt. Both pension benefits through supplemental executive retirement plans (SERPs) and deferred compensation plans are similar in their unsecured and unfunded nature, but may differ considerably in terms of maturity, withdrawal flexibility and payment form (Wei and Yermack 2011; Anantharaman et al. 2014). In addition to being relatively short-term compared to pensions, deferred compensation plans may allow early withdrawal on a predetermined schedule before retirement and offer the flexibility of exchanging the remaining balance for the firm's own stocks (Anantharaman et al. 2014). These unique features of deferred compensation plans may render them less debt-like for the CEO. Some empirical findings support the conjecture that the negative relation between CEO inside debt and cost of debt is more robust for the pension component of inside debt holdings than for the deferred compensation component. Anantharaman et al. (2014) find that the effect of CEO inside debt on debt contracting efficiency is primarily affected by the pension component of inside debt. Dang and Phan (2016) also show that the negative relation they document between inside debt and debt maturity is due mostly to the pension component.

Based on these findings, I decompose CEO inside debt holdings into pensions ($Pension_{it-1}$) and deferred compensation ($DeferComp_{it-1}$) in estimating the set of my financing regressions. In Columns (1) – (3) and Columns (4) – (6), I find consistent results with Hypothesis 1 using either pensions or deferred compensation, respectively. In Columns (7) – (9) where I include both components, I find that the relations between CEO inside debt and financing channels are observed consistently for both components. My evidence is weakly consistent with prior evidence that the contractual flexibility associated with deferred

compensation plans partially mitigates the incentive alignment effect of the deferred compensation component of CEO inside debt on the agency costs of debt and debt contracting efficiency (Anantharaman et al. 2014; Dang and Phan 2016).

In Panel C of Table 4, net debt issuance is further decomposed into short-term and long-term debt issuance following the classification in the statement of cash flows. Debt maturity structure is an important aspect of capital structure and financing decisions (e.g., Barclay and Smith 1995). Myers (1977) posits short-term debt serves as an effective monitoring mechanism to alleviate the underinvestment problem due to agency conflict. Barclay and Smith (1995) find that firms with growth options have more short-term debt in their capital structure, while large firms with few growth options have more long-term debt in theirs. Related to my study, Dang and Phan (2016) find a positive relation between CEO inside debt and short-term debt, suggesting that the lower refinancing risk facilitated by CEO inside debt motivates managers to utilize less costly short-term debt. Given the role of CEO inside debt in reducing the agency costs of debt by alleviating shareholder-creditor conflicts, it is an empirically open question whether the relation between CEO inside debt and greater use of debt financing I documented in main results is primarily affected by short-term debt or long-term debt. If the executive's inside debt holdings facilitate the firm's overall debt contracting environment (e.g., Anantharaman et al. 2014), I expect a positive relation between CEO inside debt and debt financing in the funding process for both short-term and long-term debt. If, however, the evidence in Dang and Phan (2016) were to hold in the funding process for the financing deficit, I expect the relation between CEO inside debt and debt financing to be driven more strongly by short-term debt than long-term debt.

In Panel C, I examine the relation between CEO inside debt and financing channels by disaggregating debt financing into short-term debt financing and long-term debt financing. In Columns (2) – (3), the coefficients on $CEOID_{it-1}*DEF_{it}$ are both significantly positive, which

is consistent with firms with large CEO inside debt utilizing greater amounts of both short-term and long-term debt amid a more favorable debt contracting environment.[16] I note that while Dang and Phan (2016) study the relation between CEO inside debt and the fraction of short-term debt in total debt, I examine the relative use of different financing sources in the funding process of the financing deficit.

4.4 Cross-Sectional Variations: Financial Constraint

According to the pecking order theory of Myers (1984) and Myers and Majluf (1984), firms prefer to exhaust the cheapest source of financing in the form of retained earnings before tapping capital markets for external financing. In a pecking order, debt financing is preferred to equity financing due to more severe information asymmetry in the equity capital markets. However, financially constrained firms are known to be more dependent on equity financing than financially unconstrained firms (Baker et al. 2003). Therefore, I expect that the beneficial effect of CEO inside debt on cost of debt capital and incremental debt financing will be more acute for financially constrained firms than for unconstrained firms with ready access to debt finance. Particularly, my prediction in Hypothesis 2 is that financially constrained firms with large CEO inside debt will use relatively more debt financing and less cash holdings and equity financing in funding the financing deficit than unconstrained firms.

Following prior literature on financial constraint (e.g. Almeida and Campello 2007; Farre-Mensa and Ljungqvist 2016), I employ four commonly adopted proxies for financial constraint based on ex-ante firm attributes: 1) asset size, 2) credit rating indicator, 3) Hadlock and Pierce (2010; hereafter HP) Index, and 4) Whited and Wu (2006; hereafter WW) Index. Except for the rating indicator, I use the sample median of each partitioning variable to

[16] I note that given the mean and standard deviation of short-term debt issuance, the effect of CEO inside debt on the use of short-term debt issuance seems relatively more significant.

identify constrained firms and unconstrained firms.[17] In order to alleviate the concern for endogenous relations between my proxies for financial constraint and financing decisions, financial constraint is measured at the end of year t-1.

In Table 5, for economy of space, I report summary results for the estimated coefficients on the variables of interest. For the constrained firms in each of the four panels, I find that firms with large CEO inside debt use relatively less amount of cash holdings/net equity issuance and greater amount of net debt issuance in funding their cash flow deficits. On the other hand, I generally find insignificant results for the unconstrained firms in most of the panels in Table 5. The evidence in Table 5 suggests that the effect of CEO inside debt on financing choice is more salient for financially constrained firms that have difficulty in accessing external capital than for financially unconstrained firms. Overall, my results are consistent with the cross-sectional prediction of Hypothesis 2.

4.5 Chief Financial Officer (CFO) Inside Debt

A growing literature in both accounting and finance pays a great deal of attention to the role of CFO and interplay between CEO and CFO in the shaping of corporate policies. Chava and Purnanandam (2010) find that risk-taking incentives of both CEO and CFO are distinctively related to firms' financial policies. Some studies document that the effect of CFO is even stronger than that of CEO. For instance, Kim et al. (2011) show that equity incentives of CFO are more significantly related to future stock price crash risk than those of CEO, while Anantharaman and Lee (2014) suggest that corporate pension policy is primarily shaped by the CFO's compensation incentives. Given their critical role in determining

[17] Firms with total assets less (greater) than the sample median are identified as financially constrained (unconstrained). Firms with S&P credit rating in Compustat are coded as financially unconstrained. Firms with HP Index or WW Index greater (less) than the sample median are identified as financially constrained (unconstrained). For economy of space, please refer to HP (2010) and WW (2006) for the calculation of each index.

financial reporting policies, CFOs' equity-based incentives play a stronger role in the level of earnings management than those of CEOs (Jiang et al. 2010) and CFOs exert a stronger influence on external audit fee negotiation than audit committees (Beck and Mauldin 2014).

In light of growing evidence on the significance of the CFO's compensation incentives, I examine whether the CFO's inside debt holdings affect the firm's financing behavior. In Table 6, I report the results of estimating the set of financing regressions using the CFO's inside debt holdings. In Columns (1) – (3), I find that firms with large CFO inside debt use more debt financing and less cash holdings in the funding process, suggesting that the CFO's inside debt incentives and the CEO's inside debt incentives similarly shape the firm's financing behavior. In Columns (4) – (6) where I include both executives' inside debt proxies, the results indicate that CFO inside debt is more consistently and significantly associated with the predicted financing pattern than CEO inside debt. I note that my results may have been driven by high correlation between CEO inside debt and CFO inside debt (highly significant Pearson correlation of 0.59). Taken at face value, however, these support the significance of the CFO's role and incentives in influencing corporate policies.

4.6 Characteristics of CEO and Compensation Structure

Inside debt is only one of the various features of executive compensation structure. In order to address the concern that CEO inside debt may be highly correlated with other characteristics of the CEO, I control such factors in Table 7. For example, Sundaram and Yermack (2007) find that CEO inside is highly correlated with the age of the CEO as both pensions and deferred compensation normally increase with his/her tenure with the firm. Following Chi et al. (2017), I control for cash compensation, delta, vega, age, and tenure of the CEO as well as including an indicator for the CEO-Chairman duality. In Columns (1) – (3), I continue to find robust results consistent with Hypothesis 1 that CEO inside debt is

highly correlated with greater use of net debt issuance and reduced use of cash holdings in the funding process.

5. Conclusion

Despite the growing evidence on the importance of pension benefits and deferred compensation in the optimal design of executive compensation plan, it has not been clear whether managerial incentives arising from inside debt holdings are beneficial in the context of external financing and associated with greater use of debt capital. The tension in the literature is whether CEO inside debt is associated with conservative leverage policy due to risk aversion or with increased use of debt financing thanks to improved debt contracting environment. I examine this question in the context of the firm's funding process in which the firm finances cash flow shortfalls caused by investments and payouts in excess of operating cash flows with either its cash holdings or external financing. I find that firms with large CEO inside debt use more debt financing and less cash holdings in their funding process compared to control firms. I provide additional empirical evidence that financially constrained firms benefit more from the lower cost of debt financing facilitated by CEO inside debt than financially unconstrained firms. My results remain robust to various empirical designs and control variables.

Overall, my study highlights the effects of managerial holdings of inside debt on corporate financing behavior. The results are consistent with CEO inside debt enhancing the firm's debt contracting environment by alleviating shareholder-creditor conflict and reducing the agency costs of debt.

References

Agrawal, A., and G. N. Mandelker. 1987. Managerial incentives and corporate investment and financing decisions. *The Journal of Finance* 42 (4):823-837.

Almeida, H., and M. Campello. 2007. Financial constraints, asset tangibility, and corporate investment. *Review of Financial Studies* 20 (5):1429-1460.

Amihud, Y., and B. Lev. 1981. Risk reduction as a managerial motive for conglomerate mergers. *The Bell Journal of Economics* 12 (2):605-617.

Anantharaman D., V. W. Fang and G. Gong. 2014. Inside debt and the design of corporate debt contracts. 2014. *Management Science* 60 (5):1260-1280.

Anantharaman, D., and Y. G. Lee. 2014. Managerial risk taking incentives and corporate pension policy. *Journal of Financial Economics* 111 (2):328-351.

Baker, M., J. C. Stein, and J. Wurgler. 2003. When does the market matter? Stock prices and the investment of equity-dependent firms. *The Quarterly Journal of Economics* 118 (3):969-1005.

Barclay, M. J., and C. W. Smith. 1995. The maturity structure of corporate debt. *The Journal of Finance* 50 (2):609-631.

Bebchuk, L. A. and R. J. Jackson. 2005. Executive pensions. *Journal of Corporation Law* 30 (4):823-855.

Beck, M. J., and E. G. Mauldin. 2014. Who's really in charge? Audit committee versus CFO power and audit fees. *The Accounting Review* 89 (6):2057-2085.

Bergstresser, D., and T. Philippon. 2006. CEO incentives and earnings management. *Journal of Financial Economics* 80 (3):511-529.

Bharath, S. T., P. Pasquariello, and G. Wu. 2009. Does asymmetric information drive capital structure decisions? *Review of Financial Studies* 22 (8):3211-3243.

Black, F., and M. Scholes. 1973. The pricing of options and corporate liabilities. *Journal of Political Economy* 81 (3):637-654.

Brisker, E. R., and W. Wang. 2017. CEO's inside debt and dynamics of capital structure. *Financial Management*, forthcoming.

Burns, N., and S. Kedia. 2008. Executive option exercises and financial misreporting. *Journal of Banking & Finance* 32 (5):845-857.

Bushman, R., A. Smith, and F. Zhang. 2011. Investment cash flow sensitivities really reflect related investment decisions. Working Paper.

Caliskan, D., and J. A. Doukas. 2015. CEO risk preferences and dividend policy decisions. *Journal of Corporate Finance* 35:18-42.

Campbell, T. C., N. Galpin, and S. A. Johnson. 2016. Optimal inside debt compensation and the value of equity and debt. *Journal of Financial Economics* 119 (2):336-352.

Cassell, C. A., S. X. Huang, J. Manuel Sanchez, and M. D. Stuart. 2012. Seeking safety: The relation between CEO inside debt holdings and the riskiness of firm investment and financial policies. *Journal of Financial Economics* 103 (3):588-610.

Chang, X., S. Dasgupta, G. Wong, and J. Yao. 2014. Cash-flow sensitivities and the allocation of internal cash flow. *Review of Financial Studies* 27 (12):3628-3657.

Chava, S., and A. Purnanandam. 2010. CEOs versus CFOs: Incentives and corporate policies. *Journal of Financial Economics* 97 (2):263-278.

Cheng, Q., and T. D. Warfield. 2005. Equity incentives and earnings management. *The Accounting Review* 80 (2):441-476.

Chi, S., S. X. Huang, and J. M. Sanchez. 2017. CEO inside debt incentives and corporate tax sheltering. *Journal of Accounting Research*, forthcoming.

Coles, J. L., N. D. Daniel, and L. Naveen. 2006. Managerial incentives and risk-taking. *Journal of Financial Economics* 79 (2):431-468.

Core, J., and W. Guay. 1999. The use of equity grants to manage optimal equity incentive levels. *Journal of Accounting and Economics* 28 (2):151-184.
Core, J., and W. Guay. 2002. Estimating the value of employee stock option portfolios and their sensitivities to price and volatility. *Journal of Accounting Research* 40 (3):613-630.
Dang, V. A., and H. V. Phan. 2016. CEO inside debt and corporate debt maturity structure. *Journal of Banking & Finance* 70:38-54.
Daniel, N., Y. Li, and L. Naveen. 2013. No asymmetry in pay for luck. Working Paper.
Dasgupta, S., T. H. Noe, and Z. Wang. 2011. Where did all the dollars go? The effect of cash flows on capital and asset structure. *Journal of Financial and Quantitative Analysis* 46 (5):1259-1294
Dhole, S., H. Manchiraju, and I. Suk. 2015. CEO inside debt and earnings management. *Journal of Accounting, Auditing & Finance*, forthcoming.
Edmans, A., and Q. Liu. 2011. Inside debt. *Review of Finance* 15 (1):75-102.
Eisdorfer, A., C. Giaccotto, and R. White. 2015. Do corporate managers skimp on shareholders' dividends to protect their own retirement funds? *Journal of Corporate Finance* 30:257-277.
Fama, E. F., and K. R. French. 2005. Financing decisions: Who issues stock? *Journal of Financial Economics* 76 (3):549-582.
Farre-Mensa, J., and A. Ljungqvist. 2016. Do measures of financial constraints measure financial constraints? *Review of Financial Studies* 29 (2):271-308.
Fazzari, S., R. G. Hubbard, and B. Petersen. 1988. Investment and finance reconsidered. *Brookings Papers on Economics Activity* 1: 141–195.
Fenn, G. W., and N. Liang. 2001. Corporate payout policy and managerial stock incentives. *Journal of Financial Economics* 60 (1):45-72.
Frank, M. Z., and V. K. Goyal. 2003. Testing the pecking order theory of capital structure. *Journal of Financial Economics* 67 (2):217-248.
Frank, M. Z., and V. K. Goyal. 2009. Capital structure decisions: Which factors are reliably important? *Financial Management* 38 (1):1-37.
Frydman, C., and D. Jenter. 2010. CEO compensation. *Annual Review of Financial Economics* 2 (1):75-102.
Gatchev, V. A., P. A. Spindt, and V. Tarhan. 2009. How do firms finance their investments?: The relative importance of equity issuance and debt contracting costs. *Journal of Corporate Finance* 15 (2):179-195.
Gatchev, V. A., T. Pulvino, and V. Tarhan. 2010. The interdependent and intertemporal nature of financial decisions: An application to cash flow sensitivities. *The Journal of Finance* 65 (2):725-763.
Gerakos, J. 2010. CEO pensions: Disclosure, managerial power, and optimal contracting. Working Paper.
Greene, W. H. 2012. *Econometric analysis*, 7th edition. Upper Saddle River: Prentice-Hall.
Guay, W. R. 1999. The sensitivity of CEO wealth to equity risk: An analysis of the magnitude and determinants. *Journal of Financial Economics* 53 (1):43-71.
Hadlock, C. J., and J. R. Pierce. 2010. New evidence on measuring financial constraints: Moving beyond the KZ index. *Review of Financial Studies* 23 (5):1909-1940.
He, G. 2015. The effect of CEO inside debt holdings on financial reporting quality. *Review of Accounting Studies* 20 (1):501-536.
Hemmer, T., O. Kim, and R. E. Verrecchia. 1999. Introducing convexity into optimal compensation contracts. *Journal of Accounting and Economics* 28 (3):307-327.
Hirshleifer, D., and Y. Suh. 1992. Risk, managerial effort, and project choice. *Journal of Financial Intermediation* 2 (3):308-345.

Jensen, M. C., and W. H. Meckling. 1976. Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of Financial Economics* 3 (4):305-360.
Jiang, J., K. R. Petroni, and I. Yanyan Wang. 2010. CFOs and CEOs: Who have the most influence on earnings management? *Journal of Financial Economics* 96 (3):513-526.
Kim, J.-B., Y. Li, and L. Zhang. 2011. CFOs versus CEOs: Equity incentives and crashes. *Journal of Financial Economics* 101 (3):713-730.
Leary, M. T., and M. R. Roberts. 2010. The pecking order, debt capacity, and information asymmetry. *Journal of Financial Economics* 95 (3):332-355.
Lee, J., K. J. Murphy, S.H. Oh, and M. D. Vance. 2016. Inside debt and corporate investment. Working Paper.
Liu, Y., D. C. Mauer, and Y. Zhang. 2014. Firm cash holdings and CEO inside debt. *Journal of Banking & Finance* 42:83-100.
Low, A. 2009. Managerial risk-taking behavior and equity-based compensation. *Journal of Financial Economics* 92 (3):470-490.
Merton, R. C. 1974. On the pricing of corporate debt: The risk structure of interest rates. *The Journal of Finance* 29 (2):449-470.
Myers, S. C. 1977. Determinants of corporate borrowing. *Journal of Financial Economics* 5 (2):147-175.
Myers, S. C. 1984. The capital structure puzzle. *The Journal of Finance* 39 (3):574-592.
Myers, S. C., and N. S. Majluf. 1984. Corporate financing and investment decisions when firms have information that investors do not have. *Journal of Financial Economics* 13 (2):187-221.
Petersen, M. A. 2009. Estimating standard errors in finance panel data sets: Comparing approaches. *Review of Financial Studies* 22 (1):435-480.
Phan, H. V. 2014. Inside debt and mergers and acquisitions. *Journal of Financial and Quantitative Analysis* 49 (5-6):1365-1401.
Rajgopal, S., and T. Shevlin. 2002. Empirical evidence on the relation between stock option compensation and risk taking. *Journal of Accounting and Economics* 33 (2):145-171.
Rogers, D. A. 2002. Does executive portfolio structure affect risk management? CEO risk-taking incentives and corporate derivatives usage. *Journal of Banking & Finance* 26 (2–3):271-295.
Shyam-Sunder, L., and S. C. Myers. 1999. Testing static tradeoff against pecking order models of capital structure1. *Journal of Financial Economics* 51 (2):219-244.
Srivastav, A., S. Armitage, and J. Hagendorff. 2014. CEO inside debt holdings and risk-shifting: Evidence from bank payout policies. *Journal of Banking & Finance* 47:41-53.
Sundaram, R. K., and D. Yermack. 2007. Pay me later: Inside debt and its role in managerial compensation. *The Journal of Finance* 62 (4):1551-1588.
Van Bekkum, S. 2016. Inside debt and bank risk. *Journal of Financial and Quantitative Analysis* 51 (2):359-385.
Wei, C., and D. Yermack. 2011. Investor reactions to CEOs' inside debt incentives. *Review of Financial Studies* 24 (11):3813-3840.
Whited, T. M., and G. Wu. 2006. Financial constraints risk. *Review of Financial Studies* 19 (2):531-559.

APPENDIX 1
Variable Definitions

Variable	Definition
$CEOID_{it-1}$	The ratio of the CEO's inside debt holdings to his total firm-related wealth, which is the sum of his inside debt and equity. Inside debt is measured as the sum of the present values of pensions and deferred compensation. Inside equity is measured as the value of stocks and options held by the CEO.
$CFOID_{it-1}$	The ratio of the CFO's inside debt holdings to his total firm-related wealth, which is the sum of his inside debt and equity. Inside debt is measured as the sum of the present values of pensions and deferred compensation. Inside equity is measured as the value of stocks and options held by the CEO.
$Pension_{it-1}$	Present value of pensions divided by the CEO's total firm-related wealth
$DeferComp_{it-1}$	Present value of deferred compensation divided by the CEO's total firm-related wealth
DIV_{it}	Cash dividend, scaled by the beginning-of-period total assets
INV_{it}	Investments, scaled by the beginning-of-period total assets
CF_{it}	Operating cash flows net of change in working capital, scaled by the beginning-of-period total assets
DEF_{it}	The sum of dividend and investments less operating cash flows net of change in working capital, scaled by the beginning-of-period total assets
$\triangle C_{it}$	Change in cash and cash equivalents, scaled by the beginning-of-period total
$\triangle D_{it}$	Net debt issuance, scaled by the beginning-of-period total assets
$\triangle STD_{it}$	Net short-term debt issuance, scaled by the beginning-of-period total assets
$\triangle LTD_{it}$	Net long-term debt issuance, scaled by the beginning-of-period total assets
$\triangle E_{it}$	Net equity issuance, scaled by the beginning-of-period total assets
MB_{it-1}	The ratio of market value of assets to book value of assets
SG_{it-1}	Sales growth rate
$SIZE_{it-1}$	Natural log of total assets
LEV_{it-1}	Book value of total debt, scaled by total assets
$TANGIBLE_{it-1}$	Property, plant and equipments, scaled by total assets

TABLE 1
Descriptive Statistics

Panel A: Overall Sample Descriptives

Variable	Nobs	Mean	Std	P1	P25	Median	P75	P99
$CEOID_{it-1}$	7,397	0.128	0.182	0.000	0.000	0.033	0.205	0.771
$CFOID_{it-1}$	7,105	0.134	0.195	0.000	0.000	0.033	0.204	0.830
$Pension_{it-1}$	7,397	0.069	0.139	0.000	0.000	0.000	0.068	0.649
$DeferComp_{it-1}$	7,397	0.056	0.104	0.000	0.000	0.002	0.068	0.551
DIV_{it}	7,397	0.012	0.020	0.000	0.000	0.001	0.018	0.091
INV_{it}	7,397	0.077	0.095	-0.126	0.023	0.056	0.111	0.421
CF_{it}	7,397	0.108	0.076	-0.093	0.063	0.104	0.151	0.316
DEF_{it}	7,397	-0.018	0.093	-0.232	-0.070	-0.026	0.023	0.287
$\triangle C_{it}$	7,397	0.008	0.063	-0.163	-0.018	0.003	0.034	0.202
$\triangle D_{it}$	7,397	0.010	0.072	-0.147	-0.019	0.000	0.022	0.296
$\triangle STD_{it}$	7,397	0.000	0.017	-0.078	0.000	0.000	0.000	0.075
$\triangle LTD_{it}$	7,397	0.010	0.070	-0.137	-0.015	0.000	0.017	0.296
$\triangle E_{it}$	7,397	-0.021	0.051	-0.216	-0.034	-0.001	0.002	0.096
MB_{it-1}	7,397	2.730	2.473	0.287	1.360	2.080	3.185	16.023
SG_{it-1}	7,397	0.079	0.203	-0.459	-0.019	0.065	0.157	0.895
$SIZE_{it-1}$	7,397	7.585	1.584	4.325	6.473	7.469	8.602	11.706
LEV_{it-1}	7,397	0.201	0.168	0.000	0.041	0.188	0.310	0.663
$TANGIBLE_{it-1}$	7,397	0.254	0.223	0.011	0.086	0.177	0.358	0.888

Panel B: Sample by Year

Year	Nobs	% Nobs	*Mean* $CEOID_{it-1}$	*Median* $CEOID_{it-1}$
2007	644	8.7%	0.114	0.041
2008	1,008	13.6%	0.107	0.031
2009	1,078	14.6%	0.158	0.038
2010	973	13.2%	0.136	0.033
2011	935	12.6%	0.119	0.026
2012	925	12.5%	0.136	0.033
2013	945	12.8%	0.126	0.034
2014	889	12.0%	0.117	0.033
Total		7,397	0.128	0.182

Panel C: Sample by Fama-French Industry

Industry	Nobs	% Nobs	*Mean* $CEOID_{it-1}$	*Median* $CEOID_{it-1}$
Business Service	926	12.5%	0.083	0.000
Electronic Equipment	658	8.9%	0.081	0.000
Retail	592	8.0%	0.103	0.020
Petroleum and Gas	419	5.7%	0.131	0.073
Machinery	414	5.6%	0.187	0.137
Wholesale	325	4.4%	0.146	0.065
Computers	299	4.0%	0.063	0.000
Transportation	289	3.9%	0.139	0.041
Pharmaceutical Products	274	3.7%	0.116	0.000
Medical Equipment	271	3.7%	0.073	0.000
All others	2,930	39.6%		
Total		7,397	0.128	0.182

TABLE 2
Pearson Correlations

Variable		A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
A	$CEOID_{it-1}$	1																	
B	$CFOID_{it-1}$	0.59	1																
C	$Pension_{it-1}$	0.79	0.49	1															
D	$DeferComp_{it-1}$	0.63	0.36	0.04	1														
E	DIV_{it}	0.15	0.15	0.12	0.09	1													
F	INV_{it}	-0.10	-0.08	-0.09	-0.04	-0.01	1												
G	CF_{it}	-0.08	-0.05	-0.07	-0.03	0.26	0.39	1											
H	DEF_{it}	-0.01	0.00	-0.01	0.00	-0.01	0.70	-0.36	1										
I	$\triangle C_{it}$	0.00	-0.01	0.01	-0.01	-0.01	-0.26	0.30	-0.51	1									
J	$\triangle D_{it}$	-0.04	-0.03	-0.05	-0.01	0.05	0.57	-0.03	0.62	0.09	1								
K	$\triangle STD_{it}$	-0.02	-0.01	-0.03	0.00	0.03	0.09	-0.05	0.13	-0.02	0.23	1							
L	$\triangle LTD_{it}$	-0.04	-0.03	-0.04	-0.01	0.04	0.56	-0.02	0.60	0.10	0.95	-0.06	1						
M	$\triangle E_{it}$	0.05	0.03	0.05	0.00	-0.10	0.13	-0.25	0.31	0.15	-0.17	-0.10	-0.14	1					
N	MB_{it-1}	-0.02	0.00	-0.01	-0.01	0.30	0.08	0.29	-0.09	0.03	0.04	0.01	0.04	-0.19	1				
O	SG_{it-1}	-0.12	-0.13	-0.08	-0.08	-0.07	0.17	0.14	0.04	0.04	0.06	0.01	0.06	0.02	0.11	1			
P	$SIZE_{it-1}$	0.32	0.33	0.27	0.19	0.20	-0.01	0.04	0.00	-0.02	0.05	-0.01	0.06	-0.10	0.07	-0.02	1		
Q	LEV_{it-1}	0.17	0.15	0.15	0.09	-0.01	-0.05	-0.12	0.04	-0.04	-0.09	-0.04	-0.08	0.17	0.14	-0.02	0.35	1	
R	$TANGIBLE_{it-1}$	0.08	0.09	0.07	0.05	0.01	0.25	0.20	0.10	0.00	0.05	0.01	0.05	0.11	-0.06	0.00	0.17	0.23	1

Notes: The sample period is 2007-2014.

TABLE 3
Inside Debt and Financing Choice: Main Regressions

Dependent Variable =	(1) ΔC_{it}		(2) ΔD_{it}		(3) ΔE_{it}		(4) ΔC_{it}		(5) ΔD_{it}		(6) ΔE_{it}	
	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat
Constant	0.00	-0.1	-0.03	-3.8	0.02	3.5	0.00	-0.5	-0.03	-4.3	0.02	3.6
DEF $_{it}$	**-0.35**	**-27.9**	**0.49**	**34.4**	**0.16**	**19.4**	**-0.40**	**-22.0**	**0.44**	**22.1**	**0.16**	**14.3**
DEF $_{it}$ ****CEOID*** $_{it-1}$							**0.12**	**4.2**	**0.12**	**4.0**	**-0.01**	**-0.5**
CEOID $_{it-1}$							0.00	-0.4	0.00	-1.2	0.00	1.1
MB $_{it-1}$	0.00	-0.2	0.00	7.1	0.00	-8.0	0.00	-0.1	0.00	7.2	0.00	-8.0
SG $_{it-1}$	0.02	5.2	0.01	1.9	0.01	3.9	0.02	5.1	0.01	1.7	0.01	4.0
SIZE $_{it-1}$	0.00	-3.3	0.00	8.9	-0.01	-11.4	0.00	-2.4	0.01	9.6	-0.01	-11.2
LEV $_{it-1}$	-0.01	-1.9	-0.07	-14.7	0.07	15.5	-0.01	-1.7	-0.07	-14.5	0.07	15.5
TANGIBLE $_{it-1}$	0.03	7.4	0.02	3.2	0.02	3.4	0.03	7.4	0.02	3.2	0.02	3.3
Industry FE	Yes		Yes		Yes		Yes		Yes		Yes	
Year FE	Yes		Yes		Yes		Yes		Yes		Yes	
Adjusted Rsq	28.3%		43.3%		24.5%		28.7%		43.7%		24.5%	
Nobs	7,397		7,397		7,397		7,397		7,397		7,397	

Notes: The table reports results of estimating the set of equations with changes in cash holdings, net debt issuance and net equity issuance as the dependent variables. The financing deficit, DEF_{it}, follows the definition in prior literature (Shyam-Sunder and Myers 1999; Frank and Goyal 2003) and is measured as the sum of investments and cash dividends net of operating cash flows adjusted for working capital investments (Bushman et al. 2011). Each regression model is estimated separately using ordinary least squares (OLS) with robust standard errors adjusted for firm-level clustering (Petersen 2009). Industry fixed effects are based on the Fama-French 48 industry classification. See Appendix 1 for definitions of other variables.

TABLE 4
Inside Debt and Financing Choice: Decompositions

Panel A: Subgroup Indicators for CEO Inside Debt

Dependent Variable =	(1) ΔC_{it}		(2) ΔD_{it}		(3) ΔE_{it}	
	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat
Constant	0.00	-0.5	-0.03	-4.2	0.02	3.4
DEF_{it}	**-0.41**	**-21.3**	**0.44**	**20.3**	**0.15**	**12.7**
DEF_{it}*$CEOID\_LOW_{it-1}$	**0.13**	**3.4**	**0.06**	**1.3**	**0.08**	**2.8**
$CEOID\_LOW_{it-1}$	0.00	0.8	0.00	1.3	0.00	-0.8
DEF_{it}*$CEOID\_MED_{it-1}$	**0.11**	**4.0**	**0.12**	**3.7**	**0.00**	**-0.2**
$CEOID\_MED_{it-1}$	0.00	0.3	0.00	0.8	0.00	-0.7
DEF_{it}*$CEOID\_HIGH_{it-1}$	**0.10**	**3.3**	**0.10**	**3.2**	**-0.01**	**-0.4**
$CEOID\_HIGH_{it-1}$	0.00	-0.6	0.00	-1.5	0.00	1.2
MB_{it-1}	0.00	-0.1	0.00	7.2	0.00	-8.0
SG_{it-1}	0.02	5.2	0.01	1.7	0.01	4.0
$SIZE_{it-1}$	0.00	-2.4	0.00	9.3	-0.01	-10.9
LEV_{it-1}	-0.01	-1.8	-0.07	-14.6	0.07	15.5
$TANGIBLE_{it-1}$	0.03	7.4	0.02	3.3	0.02	3.3
Industry FE	Yes		Yes		Yes	
Year FE	Yes		Yes		Yes	
Adjusted Rsq	29.0%		43.8%		24.8%	
Nobs	7,397		7,397		7,397	

Notes: The table reports results of estimating the set of equations with changes in cash holdings, net debt issuance and net equity issuance as the dependent variables. The financing deficit, DEF_{it}, follows the definition in prior literature (Shyam-Sunder and Myers 1999; Frank and Goyal 2003) and is measured as the sum of investments and cash dividends net of operating cash flows adjusted for working capital investments (Bushman et al. 2011). Each regression model is estimated separately using ordinary least squares (OLS) with robust standard errors adjusted for firm-level clustering (Petersen 2009). Industry fixed effects are based on the Fama-French 48 industry classification. See Appendix 1 for definitions of other variables.

Panel B: Decomposition of Inside Debt Compensation

	Pension Benefits						Defered Compensation						Both Included					
Dependent Variable =	(1) ΔC_{it}		(2) ΔD_{it}		(3) ΔE_{it}		(4) ΔC_{it}		(5) ΔD_{it}		(6) ΔE_{it}		(7) ΔC_{it}		(8) ΔD_{it}		(9) ΔE_{it}	
	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat
Constant	0.00	-0.3	-0.03	-4.2	0.03	3.8	0.00	-0.4	-0.03	-4.0	0.02	3.4	0.00	-0.5	-0.03	-4.3	0.02	3.7
DEF_{it}	**-0.37**	**-24.4**	**0.47**	**27.9**	**0.16**	**17.3**	**-0.39**	**-23.4**	**0.45**	**24.0**	**0.15**	**14.2**	**-0.40**	**-22.6**	**0.45**	**22.5**	**0.16**	**14.0**
DEF_{it}*Pension$_{it-1}$	**0.09**	**2.9**	**0.12**	**3.5**	**-0.03**	**-1.5**							**0.05**	**1.7**	**0.10**	**2.7**	**-0.04**	**-2.0**
Pension $_{it-1}$	0.00	0.2	0.00	-1.9	0.00	2.6							0.00	-0.1	0.00	-2.1	0.00	2.6
DEF_{it}*DeferComp$_{it-1}$							**0.12**	**4.5**	**0.10**	**3.2**	**0.02**	**1.3**	**0.11**	**3.9**	**0.08**	**2.4**	**0.03**	**1.7**
DeferComp $_{it-1}$							0.00	0.3	0.00	0.9	0.00	-0.7	0.00	0.3	0.00	1.0	0.00	-0.9
MB $_{it-1}$	**0.00**	**-0.2**	**0.00**	**7.1**	**0.00**	**-8.0**	**0.00**	**-0.1**	**0.00**	**7.2**	**0.00**	**-8.0**	0.00	-0.1	0.00	7.2	0.00	-7.9
SG $_{it-1}$	0.02	5.2	0.01	1.7	0.01	4.1	0.02	5.2	0.01	1.9	0.01	3.9	0.02	5.2	0.01	1.8	0.01	4.0
SIZE $_{it-1}$	0.00	-2.9	0.00	9.4	-0.01	-11.5	0.00	-2.7	0.00	8.8	-0.01	-10.7	0.00	-2.4	0.00	9.2	-0.01	-10.9
LEV $_{it-1}$	-0.01	-1.8	-0.07	-14.6	0.07	15.5	-0.01	-1.8	-0.07	-14.7	0.07	15.5	-0.01	-1.8	-0.07	-14.6	0.07	15.4
TANGIBLE $_{it-1}$	0.03	7.4	0.02	3.4	0.02	3.3	0.03	7.3	0.02	3.1	0.02	3.4	0.03	7.3	0.02	3.3	0.02	3.2
Industry FE	Yes		Yes		Yes		Yes		Yes		Yes		Yes		Yes		Yes	
Year FE	Yes		Yes		Yes		Yes		Yes		Yes		Yes		Yes		Yes	
Adjusted Rsq	28.5%		43.6%		24.6%		28.8%		43.5%		24.8%		28.8%		43.7%		24.7%	
Nobs	7,397		7,397		7,397		7,397		7,397		7,397		7,397		7,397		7,397	

Notes: The table reports results of estimating the set of equations with changes in cash holdings, net debt issuance and net equity issuance as the dependent variables. The financing deficit, DEF_{it}, follows the definition in prior literature (Shyam-Sunder and Myers 1999; Frank and Goyal 2003) and is measured as the sum of investments and cash dividends net of operating cash flows adjusted for working capital investments (Bushman et al. 2011). Each regression is estimated separately using ordinary least squares (OLS) with robust standard errors adjusted for firm-level clustering (Petersen 2009). Industry fixed effects are based on the Fama-French 48 industry classification. See Appendix 1 for definitions of other variables.

Panel C: Decomposition of Net Debt Issuance

Dependent Variable =	(1) ΔC_{it}		(2) ΔSTD_{it}		(3) ΔLTD_{it}		(4) ΔE_{it}	
	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat
Constant	0.00	-0.5	0.00	0.2	-0.03	-4.1	0.02	3.6
DEF_{it}	**-0.40**	**-22.0**	**0.01**	**4.6**	**0.43**	**20.9**	**0.16**	**14.3**
DEF_{it}*$CEOID_{it-1}$	**0.12**	**4.2**	**0.03**	**3.8**	**0.09**	**2.7**	**-0.01**	**-0.5**
$CEOID_{it-1}$	0.00	-0.4	0.00	1.4	0.00	-1.9	0.00	1.1
MB_{it-1}	0.00	-0.1	0.00	0.7	0.00	7.2	0.00	-8.0
SG_{it-1}	0.02	5.1	0.00	0.2	0.01	1.7	0.01	4.0
$SIZE_{it-1}$	0.00	-2.4	0.00	-0.1	0.01	9.9	-0.01	-11.2
LEV_{it-1}	-0.01	-1.7	0.00	-2.9	-0.07	-13.6	0.07	15.5
$TANGIBLE_{it-1}$	0.03	7.4	0.00	0.5	0.01	3.0	0.02	3.3
Industry FE	Yes		Yes		Yes		Yes	
Year FE	Yes		Yes		Yes		Yes	
Adjusted Rsq	28.7%		3.2%		40.1%		24.5%	
Nobs	7,397		7,397		7,397		7,397	

Notes: The table reports results of estimating the set of equations with changes in cash holdings, net short-term debt issuance, net long-term debt issuance and net equity issuance as the dependent variables. The financing deficit, DEF_{it}, follows the definition in prior literature (Shyam-Sunder and Myers 1999; Frank and Goyal 2003) and is measured as the sum of investments and cash dividends net of operating cash flows adjusted for working capital investments (Bushman et al. 2011). Each regression is estimated separately using ordinary least squares (OLS) with robust standard errors adjusted for firm-level clustering (Petersen 2009). Industry fixed effects are based on the Fama-French 48 industry classification. See Appendix 1 for definitions of other variables.

TABLE 5

Inside Debt and Financing Choice: Cross-Sectional Variations on Financial Constraint

Panel A: Asset Size

	Constrained Firms						Unconstrained Firms					
Dependent Variable =	(1) ΔC_{it}		(2) ΔD_{it}		(3) ΔE_{it}		(4) ΔC_{it}		(5) ΔD_{it}		(6) ΔE_{it}	
	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat
DEF_{it}	**-0.44**	**-20.3**	**0.42**	**17.3**	**0.14**	**11.2**	-0.27	-10.6	0.52	16.5	0.22	9.9
DEF_{it}*$CEOID_{it-1}$	**0.07**	**1.7**	**0.11**	**2.4**	**-0.03**	**-1.5**	0.03	0.9	0.07	1.6	-0.04	-1.2
Other Controls	Yes		Yes		Yes		Yes		Yes		Yes	
Industry FE	Yes		Yes		Yes		Yes		Yes		Yes	
Year FE	Yes		Yes		Yes		Yes		Yes		Yes	
Adjusted Rsq	34.4%		42.4%		22.7%		19.7%		47.1%		31.1%	
Nobs	3,698		3,698		3,698		3,699		3,699		3,699	

Panel B: S&P Credit Rating

	Constrained Firms						Unconstrained Firms					
Dependent Variable =	(1) ΔC_{it}		(2) ΔD_{it}		(3) ΔE_{it}		(4) ΔC_{it}		(5) ΔD_{it}		(6) ΔE_{it}	
	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat
DEF_{it}	**-0.44**	**-20.5**	**0.40**	**16.6**	**0.16**	**12.3**	-0.23	-8.8	0.62	21.7	0.15	7.3
DEF_{it}*$CEOID_{it-1}$	**0.08**	**2.0**	**0.13**	**2.8**	**-0.04**	**-1.7**	-0.02	-0.6	-0.05	-1.2	0.03	0.9
Other Controls	Yes		Yes		Yes		Yes		Yes		Yes	
Industry FE	Yes		Yes		Yes		Yes		Yes		Yes	
Year FE	Yes		Yes		Yes		Yes		Yes		Yes	
Adjusted Rsq	34.8%		40.0%		22.6%		18.5%		51.5%		30.5%	
Nobs	3,744		3,744		3,744		3,653		3,653		3,653	

Panel C: Hadlock and Pierce (2010) Index

	Constrained Firms						Unconstrained Firms					
Dependent Variable =	(1) ΔC_{it}		(2) ΔD_{it}		(3) ΔE_{it}		(4) ΔC_{it}		(5) ΔD_{it}		(6) ΔE_{it}	
	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat
DEF_{it}	**-0.42**	**-19.0**	**0.41**	**17.0**	**0.17**	**12.0**	-0.35	-11.4	0.49	15.3	0.16	8.5
DEF_{it}*$CEOID_{it-1}$	**0.12**	**3.0**	**0.16**	**3.4**	**-0.03**	**-1.3**	0.06	1.6	0.07	1.6	-0.01	-0.3
Other Controls	Yes		Yes		Yes		Yes		Yes		Yes	
Industry FE	Yes		Yes		Yes		Yes		Yes		Yes	
Year FE	Yes		Yes		Yes		Yes		Yes		Yes	
Adjusted Rsq	31.1%		41.7%		23.7%		27.1%		46.4%		27.4%	
Nobs	3,581		3,581		3,581		3,333		3,333		3,333	

Panel D: Whited and Wu (2006) Index

	Constrained Firms						Unconstrained Firms					
Dependent Variable =	(1) ΔC_{it}		(2) ΔD_{it}		(3) ΔE_{it}		(4) ΔC_{it}		(5) ΔD_{it}		(6) ΔE_{it}	
	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat
DEF_{it}	**-0.45**	**-20.9**	**0.40**	**17.0**	**0.15**	**11.5**	-0.26	-8.7	0.53	15.6	0.21	9.5
DEF_{it}*$CEOID_{it-1}$	**0.09**	**2.2**	**0.13**	**3.2**	**-0.05**	**-2.0**	0.01	0.1	0.04	0.8	-0.04	-1.2
Other Controls	Yes		Yes		Yes		Yes		Yes		Yes	
Industry FE	Yes		Yes		Yes		Yes		Yes		Yes	
Year FE	Yes		Yes		Yes		Yes		Yes		Yes	
Adjusted Rsq	34.8%		41.4%		20.6%		21.2%		47.3%		30.1%	
Nobs	3,567		3,567		3,567		3,567		3,567		3,567	

Notes: The table reports results of estimating the set of equations with changes in cash holdings, net debt issuance and net equity issuance as the dependent variables. The financing deficit, DEF_{it}, follows the definition in prior literature (Shyam-Sunder and Myers 1999; Frank and Goyal 2003) and is measured as the sum of investments and cash dividends net of operating cash flows adjusted for working capital investments (Bushman et al. 2011). In Panels A, C and D, observations are partitioned into constrained and unconstrained groups based on the median value of each measure of financial constraint. In Panel B, the paritions are based on whether the firm has maintained valid S&P credit rating in last fiscal year *t-1* . Each regression is estimated separately using ordinary least squares (OLS) with robust standard errors adjusted for firm-level clustering (Petersen 2009). Industry fixed effects are based on the Fama-French 48 industry classification. See Appendix 1 for definitions of other variables.

TABLE 6
Inside Debt and Financing Choice: CEO vs. CFO

	CFO Only						CEO and CFO					
Dependent Variable =	(1) ΔC_{it}		(2) ΔD_{it}		(3) ΔE_{it}		(4) ΔC_{it}		(5) ΔD_{it}		(6) ΔE_{it}	
	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat
Constant	0.00	-0.8	-0.03	-4.4	0.02	3.5	-0.01	-0.9	-0.03	-4.5	0.02	3.5
DEF $_{it}$	**-0.41**	**-23.1**	**0.44**	**22.3**	**0.16**	**14.0**	**-0.41**	**-21.9**	**0.43**	**20.8**	**0.16**	**13.6**
DEF $_{it}$ ****CEOID*** $_{it-1}$							**0.00**	**0.1**	**0.03**	**0.8**	**-0.03**	**-1.4**
CEO $_{it-1}$							0.00	-0.8	0.00	-1.3	0.00	0.8
DEF $_{it}$ ****CFOID*** $_{it-1}$	**0.16**	**6.0**	**0.15**	**5.0**	**0.01**	**0.5**	**0.16**	**4.4**	**0.13**	**3.3**	**0.03**	**1.4**
CFO $_{it-1}$	0.00	-0.1	0.00	-0.5	0.00	0.6	0.00	0.4	0.00	0.3	0.00	0.1
MB $_{it-1}$	0.00	-0.2	0.00	7.2	0.00	-8.0	0.00	-0.2	0.00	7.2	0.00	-8.0
SG $_{it-1}$	0.02	5.1	0.01	1.7	0.01	4.0	0.02	5.0	0.01	1.6	0.01	4.0
SIZE $_{it-1}$	0.00	-2.3	0.00	9.3	-0.01	-10.7	0.00	-2.1	0.01	9.5	-0.01	-10.8
LEV $_{it-1}$	-0.01	-1.6	-0.07	-14.6	0.07	15.5	-0.01	-1.6	-0.07	-14.5	0.07	15.5
TANGIBLE $_{it-1}$	0.03	7.3	0.02	3.2	0.02	3.4	0.03	7.3	0.02	3.2	0.02	3.3
Industry FE	Yes		Yes		Yes		Yes		Yes		Yes	
Year FE	Yes		Yes		Yes		Yes		Yes		Yes	
Adjusted Rsq	29.2%		43.9%		24.5%		29.2%		43.9%		24.5%	
Nobs	7,397		7,397		7,397		7,397		7,397		7,397	

Notes: The table reports results of estimating the set of equations with changes in cash holdings, net debt issuance and net equity issuance as the dependent variables. The financing deficit, DEF_{it}, follows the definition in prior literature (Shyam-Sunder and Myers 1999; Frank and Goyal 2003) and is measured as the sum of investments and cash dividends net of operating cash flows adjusted for working capital investments (Bushman et al. 2011). Each regression is estimated separately using ordinary least squares (OLS) with robust standard errors adjusted for firm-level clustering (Petersen 2009). Industry fixed effects are based on the Fama-French 48 industry classification. See Appendix 1 for definitions of other variables.

TABLE 7
Inside Debt and Financing Choice: CEO and Compensation Characteristics

Dependent Variable =	**(1)** ΔC_{it}		**(2)** ΔD_{it}		**(3)** ΔE_{it}	
	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat
Constant	-0.04	-1.5	-0.05	-1.7	0.00	0.1
DEF_{it}	**-0.40**	**-21.4**	**0.44**	**21.4**	**0.16**	**13.9**
DEF_{it}*$CEOID_{it-1}$	**0.11**	**4.0**	**0.12**	**3.6**	**0.00**	**-0.2**
$CEOID_{it-1}$	0.00	-0.5	0.00	0.5	0.00	-1.1
MB_{it-1}	0.00	0.2	0.00	5.2	0.00	-5.7
SG_{it-1}	0.02	4.9	0.00	1.0	0.02	4.9
$SIZE_{it-1}$	0.00	-1.4	0.00	0.7	0.00	-1.7
LEV_{it-1}	-0.01	-2.3	-0.07	-12.5	0.06	12.5
$TANGIBLE_{it-1}$	0.03	7.3	0.02	3.6	0.01	2.7
$ln(CashComp)_{it-1}$	0.00	1.8	0.01	3.0	0.00	-1.4
$ln(CEODelta)_{it-1}$	0.00	0.5	0.01	6.7	-0.01	-6.8
$ln(CEOVega)_{it-1}$	0.00	-1.9	0.00	0.0	0.00	-1.9
$ln(CEOAge)_{it-1}$	0.00	0.6	0.00	-0.5	0.01	1.2
$ln(CEOTenure)_{it-1}$	0.00	0.3	0.00	-2.5	0.00	3.1
$CEO\text{-}ChairDuality_{it-1}$	0.00	-0.5	0.00	-1.5	0.00	1.2
Industry FE	Yes		Yes		Yes	
Year FE	Yes		Yes		Yes	
Adjusted Rsq	28.6%		43.5%		25.7%	
Nobs	6,672		6,672		6,672	

Notes: The table reports results of estimating the set of equations with changes in cash holdings, net short-term debt issuance, net long-term debt issuance and net equity issuance as the dependent variables. The financing deficit, DEF_{it}, follows the definition in prior literature (Shyam-Sunder and Myers 1999; Frank and Goyal 2003) and is measured as the sum of investments and cash dividends net of operating cash flows adjusted for working capital investments (Bushman et al. 2011). Each regression is estimated separately using ordinary least squares (OLS) with robust standard errors adjusted for firm-level clustering (Petersen 2009). Industry fixed effects are based on the Fama-French 48 industry classification. See Appendix 1 for definitions of other variables.

국문초록

최고경영자의 이연보상 및 연금이 기업의 자금조달선택에 미치는 영향

서울대학교 대학원

경영학과 회계학전공

류 영 지

본 연구는 최고경영자의 이연보상 및 연금이 기업들의 자금조달 행동에 미치는 영향을 연구하였다. 경영자의 이연보상 및 연금이 상대적으로 높은 기업은 영업현금흐름을 초과하는 투자활동 및 배당금에 필요한 자금을 조달하는데 있어 부채발행을 더 사용하였으며 보유현금을 적게 사용함을 확인하였다. 이는 부채적 성격을 가진 경영자의 이연보상 및 연금이 기업의 부채자본조달 환경에 긍정적인 영향을 가져온다는 기존 연구결과와 기조를 같이 하고 있다. 또한 이러한 영향은 외부자본시장 접근이 용이하지 않은 재무적으로 제약이 큰 기업들에게서 더 크게 발견 되었다. 본 연구의 결과는 최적의 경영자 보상계약을 설계함에 있어 이연보상 및 연금이 기업의 자본조달능력에 미치는 영향의 중요성을 강조하고 있다.

주요어: 경영자보상, 이연보상, 퇴직연금, 외부자본조달

학번: 2015 - 20605